

CLAIMS

What is claimed is:

- 1 1. A method of defining and deploying a networked computer system, comprising the
2 steps of:
3 creating and storing a graphical representation of a logical configuration of the
4 networked computer system by
5 generating a display of a graphical workspace that can receive the
6 graphical representation;
7 receiving user input representing selecting one or more icons that
8 represent nodes of the networked computer system and moving the one or
9 more icons into the graphical workspace;
10 receiving user input representing connecting one or more of the icons
11 with one or more other icons;
12 receiving user input representing configuring one or more parameter
13 values associated with one or more of the nodes;
14 instantiating an operable computer system that conforms to the logical configuration.
- 1 2. A method of as recited in Claim 1, further comprising the steps of:
2 based on the graphical representation, automatically creating and storing a textual
3 representation of a logical configuration of the networked computer system
4 according to a structured markup language.
- 1 3. A method of as recited in Claim 1, further comprising the steps of:
2 based on the textual representation, generating one or more commands for one or
3 more switch devices that are interconnected to one or more computing
4 elements and storage devices, wherein the commands instruct the switch
5 devices to logically connect the computing elements and storage devices into
6 an operable computer system that conforms to the logical configuration.
- 1 4. A method of as recited in Claim 1, further comprising the steps of validating the
2 graphical representation to verify that a physical computer system corresponding to
3 the graphical representation may be properly instantiated.

1 5. A method as recited in Claim 1, wherein one or more of the icons each include one or
2 more graphical representations of ports, and further comprising the step of visually
3 highlighting one of the graphical representations of ports when it has a connection to
4 another port.

1 6. A method as recited in Claim 1, further comprising the step of generating a display
2 that includes a palette of the icons, wherein the palette includes icons representing a
3 subnet, a server, a firewall, and a load balancer.

1 7. A method as recited in Claim 1, further comprising the step of generating a display
2 that includes a panel that displays information about the networked computer system
3 that corresponds to the graphical representation, including its state of development
4 and type.

1 8. A method as recited in Claim 1, further comprising the step of generating a display
2 that includes a graphical state icon that visually indicates a current state of the
3 networked computer system that corresponds to the graphical representation.

1 9. A method as recited in Claim 1,
2 wherein the one or more icons comprise a subnet icon that includes a plurality of
3 connection points,
4 wherein the step of receiving user input representing moving the one or more icons
5 comprises the step of receiving user input representing expanding the subnet
6 icon, and
7 further comprising the step of, in response to receiving user input representing
8 expanding the subnet icon, generating an updated display of the subnet icon
9 that includes a larger plurality of connection points.

1 10. A method as recited in Claim 1,
2 wherein the one or more icons comprise a subnet icon that includes a plurality of
3 connection points,

4 wherein the step of receiving user input representing moving the one or more icons
5 comprises the step of receiving user input representing contracting the subnet
6 icon, and
7 further comprising the step of, in response to receiving user input representing
8 contracting the subnet icon, generating an updated display of the subnet icon
9 that includes a smaller plurality of connection points.

1 11. A method as recited in Claim 1, further comprising the steps of:
2 receiving user input that identifies a disk image by identifying a name of the image, a
3 server of the networked computer system from which to obtain the image, and
4 a disk of the server of the networked computer system from which to obtain
5 the image;
6 creating and storing information defining a disk image based on the user input and
7 based on contents of the identified disk of the server.

1 12. A method of graphically defining and deploying a networked computer system,
2 comprising the steps of:
3 creating and storing a graphical representation of a logical configuration of the
4 networked computer system;
5 based on the graphical representation, automatically creating and storing a textual
6 representation of a logical configuration of the networked computer system
7 according to a structured markup language;
8 based on the textual representation, generating one or more commands for one or
9 more switch devices that are interconnected to one or more computing
10 elements and storage devices, wherein the commands instruct the switch
11 devices to logically connect the computing elements and storage devices into
12 an operable computer system that conforms to the logical configuration.

1 13. A method as recited in Claim 12, wherein creating and storing a textual representation
2 comprises the steps of creating and storing a textual representation of a logical
3 configuration of the networked computer system according to a structured markup
4 language, wherein the textual representation includes at least one element defining an

5 automatically created monitor process for monitoring one or more parameters of one
6 or more of the computing elements.

1 14. A method as recited in Claim 12, wherein creating and storing a textual representation
2 comprises the steps of creating and storing a textual representation of a logical
3 configuration of the networked computer system according to a structured markup
4 language, wherein the textual representation includes at least one element defining an
5 automatic power management function for one or more of the computing elements.

1 15. A method as recited in Claim 12, wherein the textual representation comprises:
2 at least one server role definition comprising at least a role name value and a
3 hardware type value; and
4 one or more definitions of servers of the networked computer system, wherein each
5 definition of a server uses and references the server role definition.

1 16. A method as recited in Claim 12, wherein the textual representation comprises:
2 at least one server role definition comprising at least a role name value and a
3 hardware type value; and
4 a plurality of definitions of servers in a server tier of the networked computer system,
5 wherein each definition of a server uses and references the server role
6 definition.

1 17. A method as recited in Claim 12, wherein the textual representation comprises:
2 at least one definition of a load balancing function;
3 at least one server tier definition that defines a plurality of servers that receive
4 inbound traffic from the load balancing function; and
5 at least one fixed server definition that defines a fixed server that is associated with
6 one of the servers in the server tier.

1 18. A method as recited in Claim 12, wherein the textual representation comprises:
2 at least one server tier definition that defines a plurality of servers that receive
3 inbound traffic from a load balancing function; and

4 at least one definition of the load balancing function, comprising an output port value,
5 an input port value, a virtual address value, a load balancing policy value, and
6 a tier value that identifies the server tier that is managed using the load
7 balancing function.

1 19. A method as recited in Claim 12, wherein the textual representation comprises at least
2 one server tier definition that defines a plurality of servers that receive inbound traffic
3 from the load balancing function; and wherein each server tier definition comprises
4 one or more input port values, a role value, and information specifying a maximum
5 number of physical servers and a minimum number of physical servers for use in a
6 server tier represented by the server tier definition.

1 20. A method as recited in Claim 12, wherein the textual representation comprises at least
2 one fixed server definition that defines a statically addressed server of the networked
3 computer system; and wherein each server definition comprises one or more input
4 port values that identify a virtual local area network, a role value that identifies a
5 processing role carried out by the server, and information specifying a network
6 address of the server.

1 21. A method as recited in Claim 12, further comprising the steps of:
2 associating a first server definition of the textual representation with a graphical icon,
3 wherein the first server definition comprises at least one external entity
4 declaration that represents a network address of a server that is represented by
5 the first server definition;
6 creating and storing, in the textual representation, a copied server definition based on
7 duplicating the first server definition that is associated with the graphical icon;
8 resolving each external entity declaration of the server definition of the textual
9 representation and the copied server definition of the textual representation
10 into a different actual network address;
11 based on the textual representation, generating one or more commands for one or
12 more switch devices that are interconnected to one or more computing
13 elements and storage devices, wherein the commands instruct the switch

14 devices to logically connect the computing elements and storage devices into
15 an operable computer system that conforms to the logical configuration.

1 22. A method as recited in Claim 12, further comprising the steps of:
2 receiving a first server definition that omits a network address of a server that is
3 represented by the first server definition;
4 creating and storing, in the textual representation, a copied server definition based on
5 duplicating the first server definition that is associated with the graphical icon;
6 determining a dynamic network address value for use with the server that is
7 represented by the first server definition;
8 based on the textual representation, generating one or more commands for one or
9 more switch devices that are interconnected to one or more computing
10 elements and storage devices, wherein the commands instruct the switch
11 devices to logically connect the computing elements and storage devices into
12 an operable computer system that conforms to the logical configuration.

1 23. A method as recited in Claim 12, wherein the textual representation comprises at least
2 one firewall definition that comprises a firewall name value, a plurality of port values
3 that define logical connections to a firewall device associated with the firewall
4 definition, and one or more definitions of services that the firewall is allowed to
5 permit or deny.

1 24. A method as recited in Claim 12, wherein the textual representation comprises:
2 at least one server role definition comprising at least a role name value and a
3 hardware type value;
4 a disk attribute definition that defines additional local disk storage for the server
5 defined in the server role definition, comprising a drive name value and a
6 drive size value; and
7 one or more definitions of servers of the networked computer system, wherein each
8 definition of a server uses and references the server role definition.

- 1 25. A method as recited in Claim 12, wherein the textual representation comprises an
2 action definition that defines actions for execution for each server in a tier of one or
3 more servers when an additional server is added to the tier.
- 1 26. A method as recited in Claim 12, wherein the textual representation comprises an
2 action definition that defines actions for execution for each server in a tier of one or
3 more servers when one of the servers is removed from the tier.
- 1 27. A method of defining and deploying a computer system, comprising the steps of:
2 creating and storing a graphical representation of a logical configuration of the
3 computer system based on selecting one or more first icons representing
4 computing elements of the computer system;
5 based on the graphical representation, automatically generating one or more
6 commands for one or more switch devices that are interconnected to one or
7 more computing elements and storage devices, wherein the commands instruct
8 the switch devices to logically connect the computing elements and storage
9 devices into an operable computer system that conforms to the logical
10 configuration.
- 1 28. A method as recited in Claim 27, wherein the first icons include a firewall icon
2 representing a network firewall device.
- 1 29. A method as recited in Claim 27, wherein the first icons include a load balancer icon
2 representing a load balancing router device.
- 1 30. A method as recited in Claim 27, further comprising the steps of creating and storing
2 the graphical representation of a logical configuration of the computer system based
3 on also selecting one or more second icons representing network elements of the
4 computer system.

1 31. A method as recited in Claim 30, wherein the second icons include a subnet icon
2 representing a sub-network to which one or more of the first icons are connected.

1 32. A method as recited in Claim 27, further comprising validating the graphical
2 representation of the computer system by verifying that each computing element is
3 properly logically coupled within the graphical representation such that the computer
4 system is likely to operate properly when physically created and activated.

1 33. A method as recited in Claim 27, further comprising validating the graphical
2 representation of the computer system in response to user selection of a validation
3 function, by verifying that each computing element is properly logically coupled
4 within the graphical representation such that the computer system is likely to operate
5 properly when physically created and activated.

1 34. A method as recited in Claim 27, further comprising storing one or more annotations
2 of one or more of the computing elements in response to receiving user input of the
3 annotations.

1 35. A method as recited in Claim 27, further comprising displaying a text view of the
2 computer system, wherein the text view comprises a textual representation of a
3 logical configuration of the computer system according to a structured markup
4 language that is automatically created and stored based on the graphical
5 representation.

1 36. A method as recited in Claim 35, further comprising the steps of receiving user input
2 representing a movement of one or more of the first icons; displaying the first icons in
3 modified positions based on the movement; and automatically updating the textual
4 representation to result in creating and storing a modified textual representation that

5 represents the logical configuration of the computer system including the modified
6 positions.

1 37. A computer-readable medium carrying one or more sequences of instructions for
2 defining and deploying a computer system, wherein execution of the one or more
3 sequences of instructions by one or more processors causes the one or more
4 processors to perform the steps of:
5 creating and storing a graphical representation of a logical configuration of the
6 networked computer system;
7 based on the graphical representation, automatically creating and storing a textual
8 representation of a logical configuration of the networked computer system
9 according to a structured markup language;
10 based on the textual representation, generating one or more commands for one or
11 more switch devices that are interconnected to one or more computing
12 elements and storage devices, wherein the commands instruct the switch
13 devices to logically connect the computing elements and storage devices into
14 an operable computer system that conforms to the logical configuration.

1 38. A computer-readable medium carrying one or more sequences of instructions for
2 defining and deploying a computer system, wherein execution of the one or more
3 sequences of instructions by one or more processors causes the one or more
4 processors to perform the steps of:
5 creating and storing a graphical representation of a logical configuration of the
6 computer system based on selecting one or more first icons representing
7 computing elements of the computer system;
8 based on the graphical representation, automatically generating one or more
9 commands for one or more switch devices that are interconnected to one or
10 more computing elements and storage devices, wherein the commands instruct
11 the switch devices to logically connect the computing elements and storage
12 devices into an operable computer system that conforms to the logical
13 configuration.

- 1 39. A computer-readable medium carrying one or more sequences of instructions defining
2 and deploying a networked computer system, wherein execution of the one or more
3 sequences of instructions by one or more processors causes the one or more
4 processors to perform the steps of:
5 creating and storing a graphical representation of a logical configuration of the
6 networked computer system by
7 generating a display of a graphical workspace that can receive the
8 graphical representation;
9 receiving user input representing selecting one or more icons that
10 represent nodes of the networked computer system and moving the one or
11 more icons into the graphical workspace;
12 receiving user input representing connecting one or more of the icons
13 with one or more other icons;
14 receiving user input representing configuring one or more parameter
15 values associated with one or more of the nodes;
16 instantiating an operable computer system that conforms to the logical configuration.
- 1 40. An apparatus for defining and deploying a networked computer system, comprising:
2 means for creating and storing a graphical representation of a logical configuration of
3 the networked computer system by
4 generating a display of a graphical workspace that can receive the
5 graphical representation;
6 receiving user input representing selecting one or more icons that
7 represent nodes of the networked computer system and moving the one or
8 more icons into the graphical workspace;
9 receiving user input representing connecting one or more of the icons
10 with one or more other icons;
11 receiving user input representing configuring one or more parameter
12 values associated with one or more of the nodes;
13 means for instantiating an operable computer system that conforms to the logical
14 configuration.

1 41. An apparatus for defining and deploying a networked computer system, comprising:
2 a processor;
3 a network interface accessible to the processor and configured to receive information
4 from a computer network in which the processor participates;
5 a computer-readable medium accessible to the processor and carrying one or more
6 sequences of instructions defining and deploying a networked computer
7 system, wherein execution of the one or more sequences of instructions by
8 one or more processors causes the one or more processors to perform the steps
9 of
10 creating and storing a graphical representation of a logical configuration of the
11 networked computer system by
12 generating a display of a graphical workspace that can receive
13 the graphical representation;
14 receiving user input representing selecting one or more icons
15 that represent nodes of the networked computer system and moving
16 the one or more icons into the graphical workspace;
17 receiving user input representing connecting one or more of the
18 icons with one or more other icons;
19 receiving user input representing configuring one or more
20 parameter values associated with one or more of the nodes;
21 instantiating an operable computer system that conforms to the logical
22 configuration.

1